



Adam Equipment

MDW MCW Service Manual

Part No- 700660171 – rev C1 January 2012

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1.0 PRODUCT DESCRIPTION

The MDW series of health and fitness scales are available in 3 different models.

The MDW 160M offering height and weight measurements up to 2.1 metres and 160kg, this is a mechanical scale using a lever work system in the base and a balancing beam type indication.

The MDW 250L offering height and weight measurement up to 2.1 metres and 250kg x 0.1kg.

The MDW 300L offering height and weight measurement up to 2.1 metres and 300kg x 0.05kg, as well as calculating your BMI following height entry into the Indicator.

The MCW 300L is the wheelchair version and has the same functions and specifications as the MDW 300L.

A single load cell is used for all 3 L models mounted to the weighing platform and connected to a digital Indicator through a pillar via a cable

The digital Indicator used for both capacity models is very similar, the main difference being that the 300kg capacity models use a different software version and have rs 232 as standard.

All L type models have as standard a lead acid rechargeable battery fitted internally to the Indicator.



2.0 SPECIFICATION TABLE

MODEL	CAPACITY AND DIVISION	BASE SIZE mm
MDW 160M	160kg x 0.1kg	275 x 375
MDW 250L	250kg x 0.1kg	275 x 375
MDW 300L	300kg x 0.05kg	275 x 375
MCW 300L	300kg x 0.05kg	450 x 450

3.0 TROUBLE SHOOTING GUIDE

PROBLEM	POSSIBLE CAUSES
Poor weighing Performance	<p>Check for interference with the weighing platform</p> <p>Check that the load cell is fully tightened or the lever works are connected correctly</p> <p>Check that the adjustable weights on the beam are in the correct position</p> <p>Check that the load cell cable is securely connected and not damaged</p> <p>Check that the overload stop is not incorrectly adjusted or loose</p> <p>Check that the product has good stability</p>
Incorrect height measuring	<p>Height measuring device is loose</p> <p>Height measuring device being operated incorrectly</p>

4.0 ERROR MESSAGES FOR MDW MCW

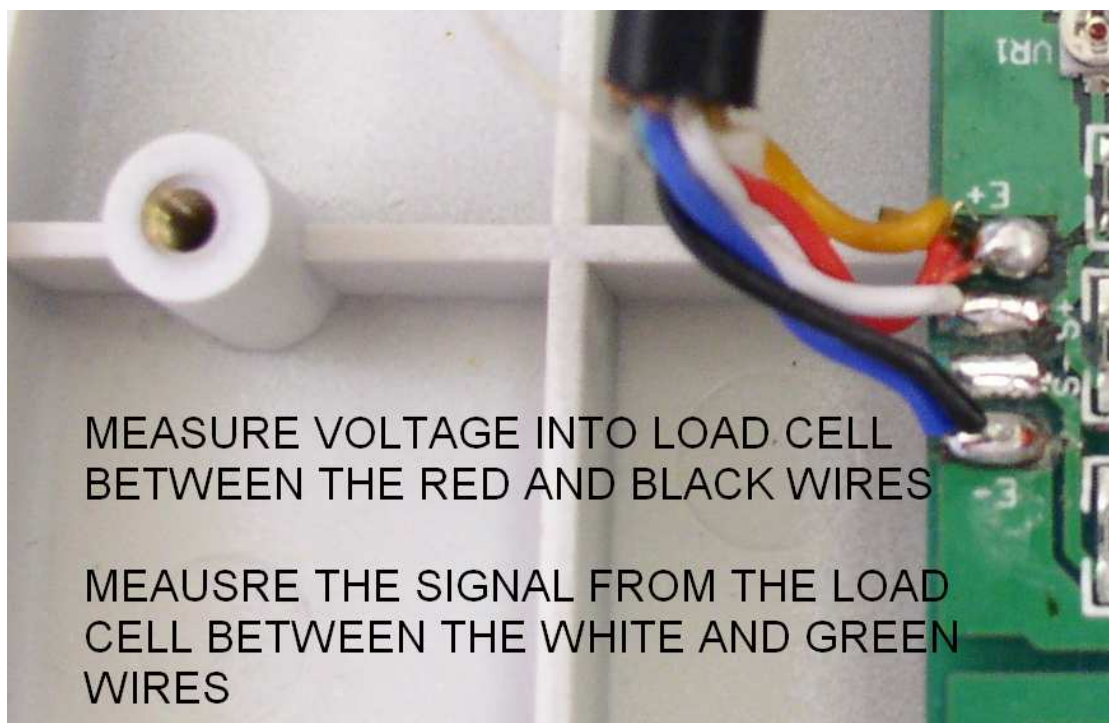
ERROR MESSAGE	DESCRIPTION	POSSIBLE CAUSES
0_ _ _ _ _	Zero point exceeds range	Load cell damage, main PCB fault, Weight left on weighing platform
0_ _ _ _ _	Zero point is under range	Load cell damage, main PCB fault, Load cell connection problem
Ad_ _ _ _ _	A/d exceeds the maximum range	Improper calibration of the indicator, Load cell damage, main PCB fault
Ad_ _ _ _ _	A/d is below the minimum range	Improper calibration of the indicator, Load cell damage, main PCB fault
EEP.Er	EEPROM error	Processor failure
CAL.Er	Error when in calibration mode	Incorrect operation of calibration, Incorrect weight applied for calibration, Weight unstable in calibration mode
Lo.bat	Internal battery voltage too low	Battery requires recharging or is faulty, Power adaptor is faulty, main PCB fault
FULL	The weight on the platform exceeds the capacity of the scale	Person is too heavy, Error in calibration

To evaluate that the load cell signal output is correct you can make certain measurements. The load cell functions using a 5Vdc input and this can be checked by placing two individual probes from a multi meter between the (exc +) and (exc-) cables where the load cell cable attaches to the Main PCB or load cell connector.

If 5Vdc is present then power is being provided correctly to the load cell, the next step is to measure the output of the load cell, this can be done by placing the 2 probes between the (sig +) and (sig -) wires. In order to obtain an accurate reading the (sig +) and (sig -) wires must be detached (de-soldered) from the connector.

You should expect to see a positive voltage reading of between 0 and 2 milli volts when the load cell assembly is at no load, and when a downward force is applied to the load cell assembly the reading should increase.

If with no load a reading of more than 2 milli volts is recorded then this suggests damage to the load cell may have occurred and a replacement load cell is required.



5.0 LOAD CELL REMOVAL AND REPLACEMENT

When replacing a load cell the correct type and capacity load cell should be selected, once fitted it will need to be calibrated and checked, there is an overload stop that should be adjusted to protect the load cell.

The overload stop should be adjusted to allow the minimum downward movement of the load cell once full load is on the weighing platform, set the overload stop by placing full load evenly onto the platform then adjust the stop screw before locking it into position using the nut provided.

To replace a load cell on an MCW firstly unscrew the 4 x fixing screws that secure the foot rest to the chair assembly and remove, then unscrew the 4 x fixing screws that secure the chair assembly to the main frame.

This then exposes the weighing platform for both the MCW L and MDW L.

Unscrew the 4 x load cell fixing bolts that secure the load cell to the weighing platform and remove.

Turn the platform over and unscrew the 4 x load cell fixing bolts that secure the load cell to the main base.

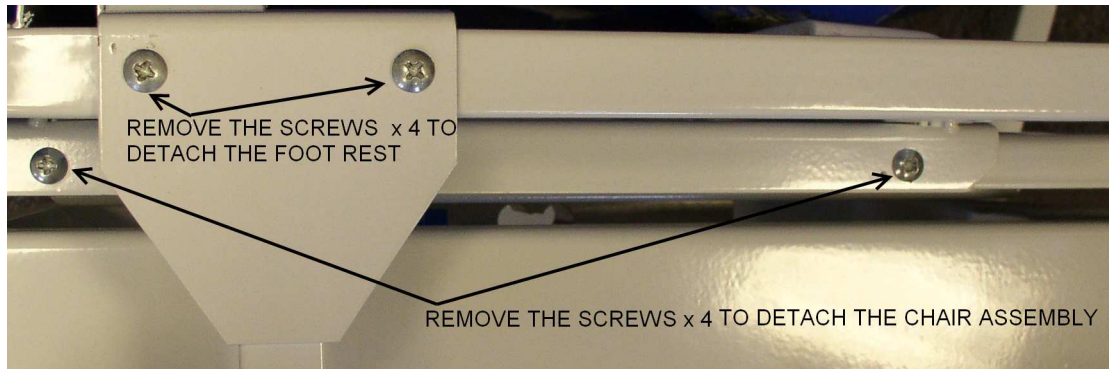
The load cell can then be removed and disconnected from the cable connector.

Fit the new load cell to the main base ensuring that the arrow for direction of movement points downwards and the 4 x fixing bolts are tightened well, then solder the wires to the Indicator connector.

Refit the weighing platform and tighten the 4 x fixing bolts, check that the overload stop is correctly set before testing.

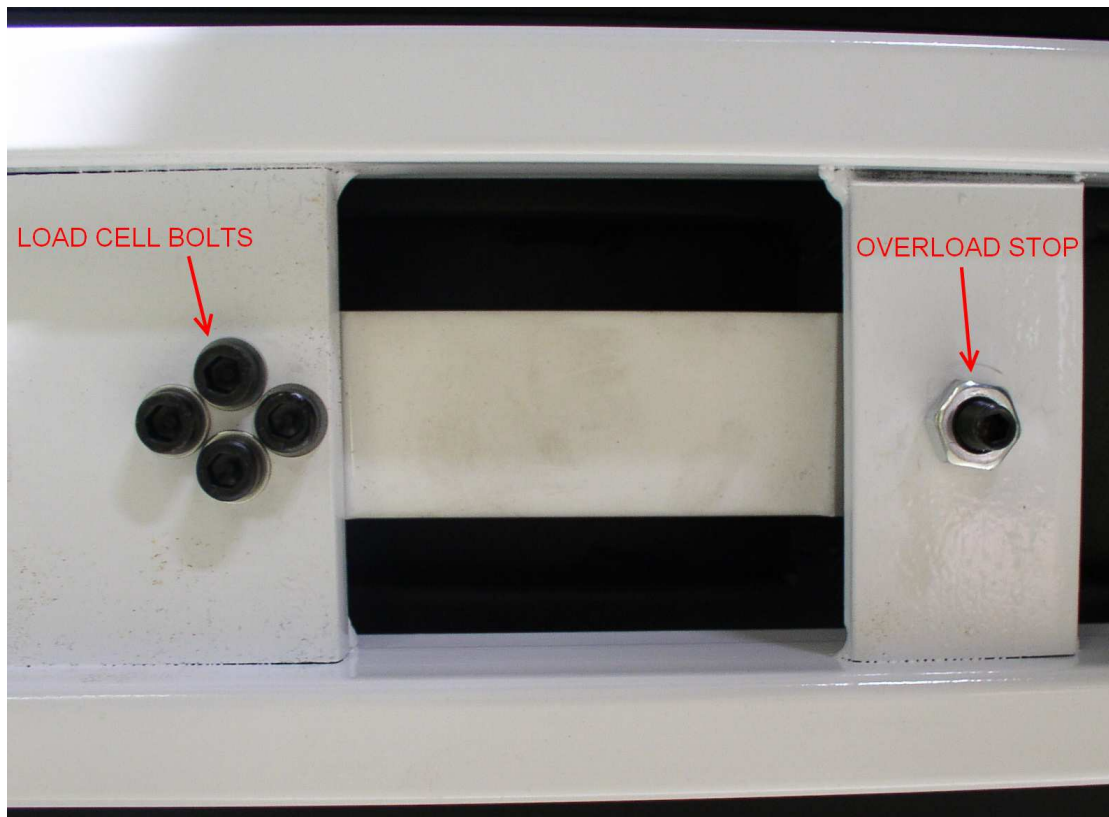
Follow the steps below to remove and replace a load cell.

MCW



MCW and MDW L





Calibration of the new load cell will be required and a check for Repeatability, Off centre loading and Linearity should be made.

Main PCB faults are very rare, if you have a problem where power to the PCB is correct and the load cell has been checked and confirmed as fully functional then replacement of the Main PCB is the most effective method of repair.

If this is the case, the PCB number and model of machine should be made clear so that the PCB can be programmed and checked first, once checked the PCB can then sent to be fitted directly to the Indicator.

Calibration can then be performed and the unit should function correctly

6.0 LOAD CELL WIRE TO INDICATOR CONNECTIONS

All load cell to Indicator cables are 4 core and wired via a connector following the pin numbers as below.

Pin 1 Excitation plus+ Red

Pin 2 Excitation minus – Black

Pin 3 Signal minus – Green

Pin 4 Signal Plus + White

The MDW 160M relies on a lever system in the base using bearings and knife edges to transfer the force applied to the weighing platform to a central column.

Connected to the top of this column is a beam with a pivoting knife edge, sliding the poise weights along this beam to a graduated weight marking balances the beam when a weight is applied to the weighing platform, the marking is then observed to indicate your weight reading.

To calibrate the poise weights you require a load to be added to the weighing platform equal to the maximum marked position on the beam for that poise weight, move the poise weight to the marked position and the beam should balance, if you do not find an accurate balance then add or remove mass from the poise weight.

Each poise weight should be adjusted individually using its own beam.

The zero poise weight should only be adjusted so that a zero point can easily be achieved with the zero screw, this poise weight has no direct effect on the calibration of the MDW.

The knife edges in the base need to be located into the shackles that contains the bearings, if positioned correctly the top pan should always swing freely when moved, if there is any sign of a stiff or uneasy movement then this could point to the base lever works being out of position.

To observe the lever works correctly you need to have access from the underside, you will see 4 x platform retaining stops, these are square metal plates held on by a screw that need to be removed for the weighing platform to be detached, once detached you can view the lever works from above.

At this point you can observe all of the connecting knife edges and bearings to ensure they are in position, the lever work system should swing and move easily when correct



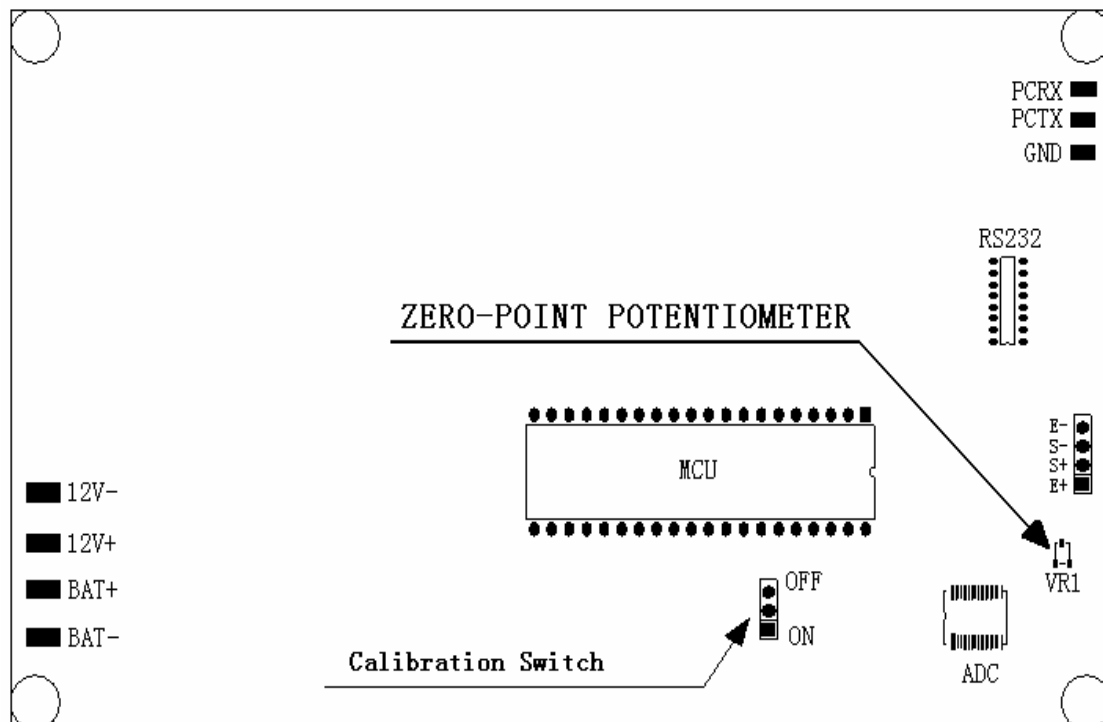
7.0 CALIBRATION FOR L MODELS

Before calibrating the scale, you should ensure that you have a suitable known qualified weight for calibration.

1. When in normal weighing mode with the scale at zero press and hold down the **[TARE]** and **[ON / OFF]** keys to enter the calibration mode.
2. If the calibration switch is in the off position on the main PCB inside the scale, the indicator will show "CAL OFF" and then exit this mode, if so remove the rear cover of the Indicator and place the jumper in the "ON" position. If the indicator shows "CAL-?", the scale is ready for calibration.
3. When the indicator shows "CAL-?", press the **[TARE]** key to confirm and go to next step.
4. When '0.0' is displayed the scale will begin to calibrate the scale's zero-point. Ensure that there is no load or weight on the scale's platform. Press the **[TARE]** key to confirm.
5. A few seconds after the **[TARE]** key has been pressed in step 4 the scale will show "300.0" and the kg LED will be illuminated, or "600.0" and the lb LED will be illuminated depending on which unit you have chosen, this is the default calibration weight from the factory. Press the **[UNIT]** key to select the calibration weight unit that you want to calibrate in. Press the **[Print/Hold]** key to choose a different calibration weight value (50kg, 100kg, 150kg, 200kg, 250kg, 300kg or 100lb, 200lb, 300lb, 400lb, 500lb, 600lb); Then put on the weight that you selected and press the **[TARE]** key to confirm the chosen standard weight that was selected. The displayed data will flash on the display and if the scale accepts the calibration data it will calculate and store the information into the EEPROM. If an error has occurred, the scale will display "CAL. Er" and return back to step 4 for re-calibration. If the loaded weight is not within the range of 95% to 105% of the weight value you selected the scale will not calibrate but display "CAL. Er" and return back to step 4 for re-calibration.)
6. If zero cannot be calibrated at step 4 the ADC needs to be checked and possibly adjusted. Press and hold the **[ON/OFF]** and **[PRINT/HOLD]** keys for three seconds after powering up. The display should show "code" then the raw ADC counts. The potentiometer VR1 can be adjusted until the counts with no load are between 20,000 and 30,000. For a working unit the ADC counts should increment approx 35,000 for a 50kg calibration mass loaded. VR1 is situated on the main PCB, please see below diagram.

7. Check the calibration by putting the weight that you calibrated at back on the scale, if it is not correct repeat the calibration process again.

A FACTORY Calibration can be performed if you have problems with the USER calibration, to carry out a FACTORY Calibration press and hold down simultaneously the **[UNIT]** and **[TARE]** buttons for 3 seconds whilst the reading is at ZERO, from this point on follow the procedure above from point 2.



8.0 PARAMETERS

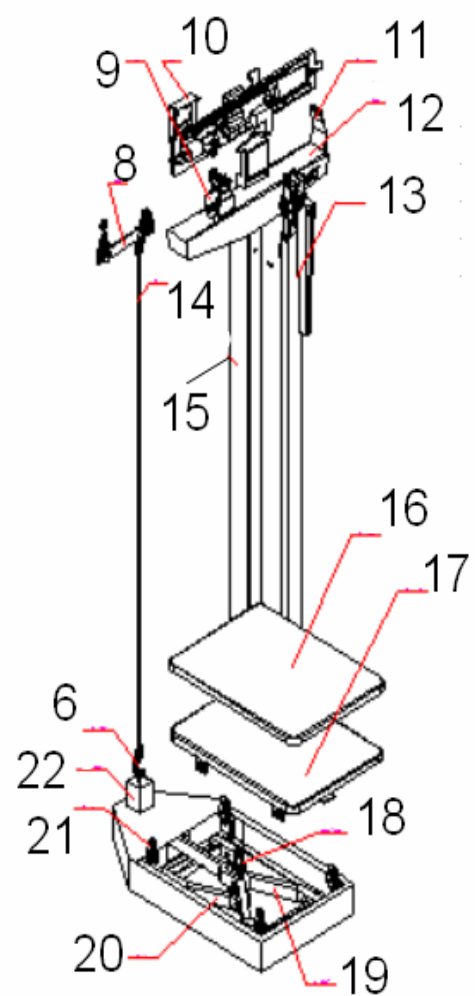
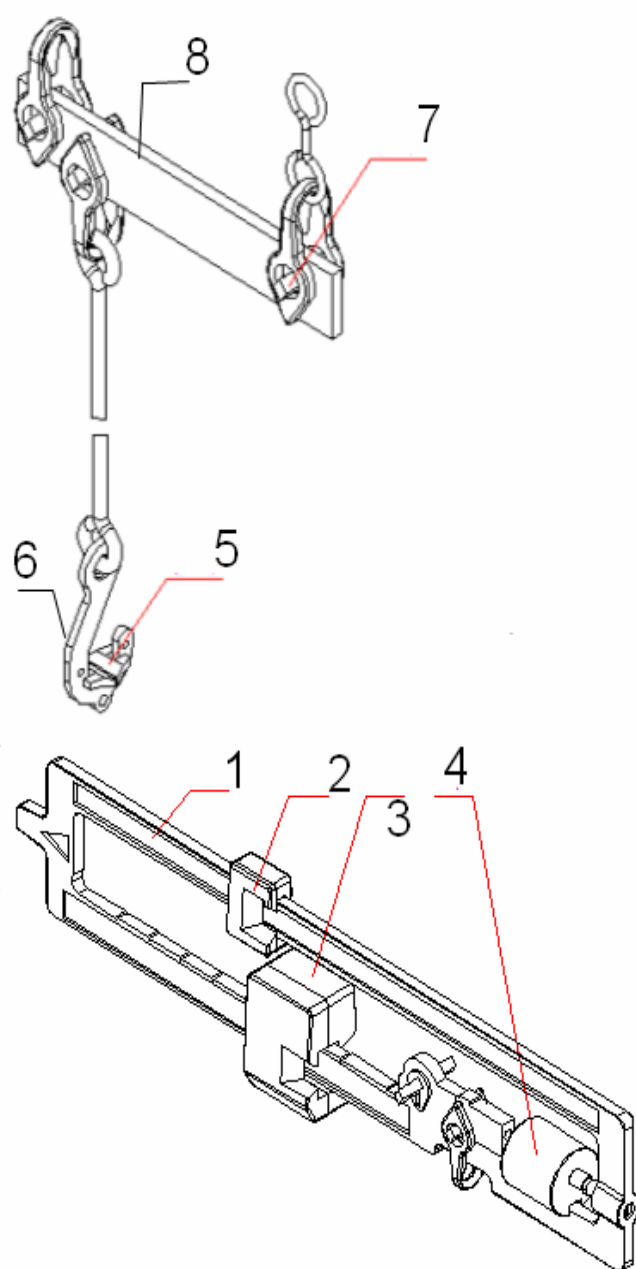
This indicator has 4 parameter settings that can be selected.

1. When the scale is in normal weighing mode, press and hold down the **[ON / OFF]** key and the **[UNIT]** key for 3 seconds until '**Setup**' is shown on the display.
2. When in the '**Setup**' mode, press the **[Print/Hold]** key to change the flashing digits, and **[TARE]** key to confirm the flashing digits and move to the next parameter setting. Press the **[ON / OFF]** key to exit the set up mode.
3. Parameters setting summary:

Parameter	Available Settings	Factory Setting	Setting
A.o.t.	00-15	05	Auto-off time: No auto-off = 00. 01-15 minutes auto-off time.
P.H.	0,1,2	1	Print and Hold Button function 0 = Only Print Function 1 = Only Hold Function 2 = both HOLD and PRINT function To PRINT, push button once To HOLD, push button down for 3 seconds
H.t	0-4	0	Hold time: 0 = no time limit. 1 = 10 seconds 2 = 30 seconds 3 = 60 seconds 4 = 120 seconds
S.F.	0-3	0	RS 232 Control 0 = No RS232 Function. 1 = Continuously outputs display data. 2 = Outputs display data when PRINT is pressed 3 = Bi-directional communication (the scale receives and executes commands from the HOST device)

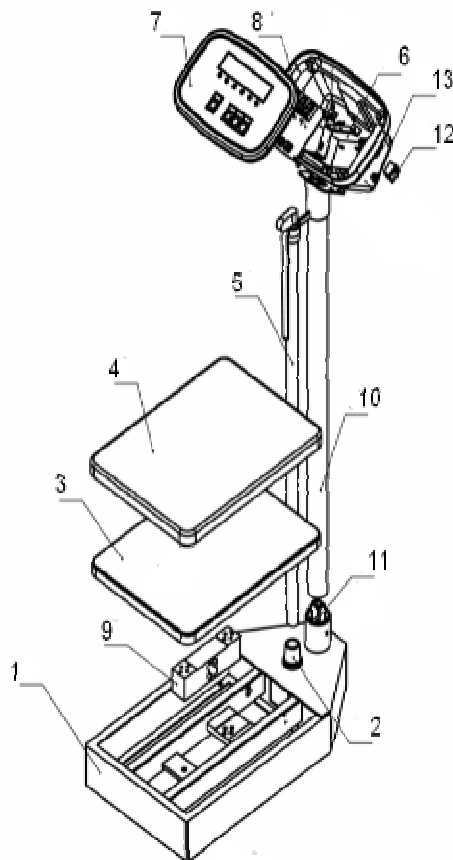
9.0 PARTS LISTS

MDW 160M		
Part number	Description	Item No
7.00.1.0.0184	WEIGHING RULER	1
7.00.1.0.0134	SMALL POISE WEIGHT	2
7.00.1.0.0135	LARGE POISE WEIGHT	3
7.00.1.0.0136	ZERO BALANCE WEIGHT	4
7.00.1.0.0132	KNIFE EDGE BEARING FOR BOTTOM OF CONNECTING ROD	5
7.00.1.4.0005	CONNECTING ROD HOOK	6
7.00.1.2.0001	PIVOT	7
7.00.1.0.0130	CONNECTING ROD LEVER	8
7.00.1.2.0002	BRACKET	9
7.00.2.3.0004	PLASTIC COVER	10
7.00.1.2.0003	EYE LOOP	11
7.00.1.0.0137	PILLAR HEAD(T SHAPE)	12
7.00.2.0.0047	HEIGHT ROD	13
7.00.1.0.0129	BASE TO INDICATOR CONNECTING ROD	14
7.00.1.0.0142	PILLAR	15
7.00.2.0.0046	PLASTIC PLATFORM COVER	16
7.00.1.0.0133	METAL PLATFORM	17
7.00.1.0.0139	CENTRE LINK	18
7.00.1.0.0141	LONG LEVER	19
7.00.1.0.0140	SHORT LEVER	20
7.00.1.0.0138	CORNER LINK	21
7.00.1.0.0128	BASE FRAME	22
7.00.3.0.0011	COMPLETE PACKAGING SET	



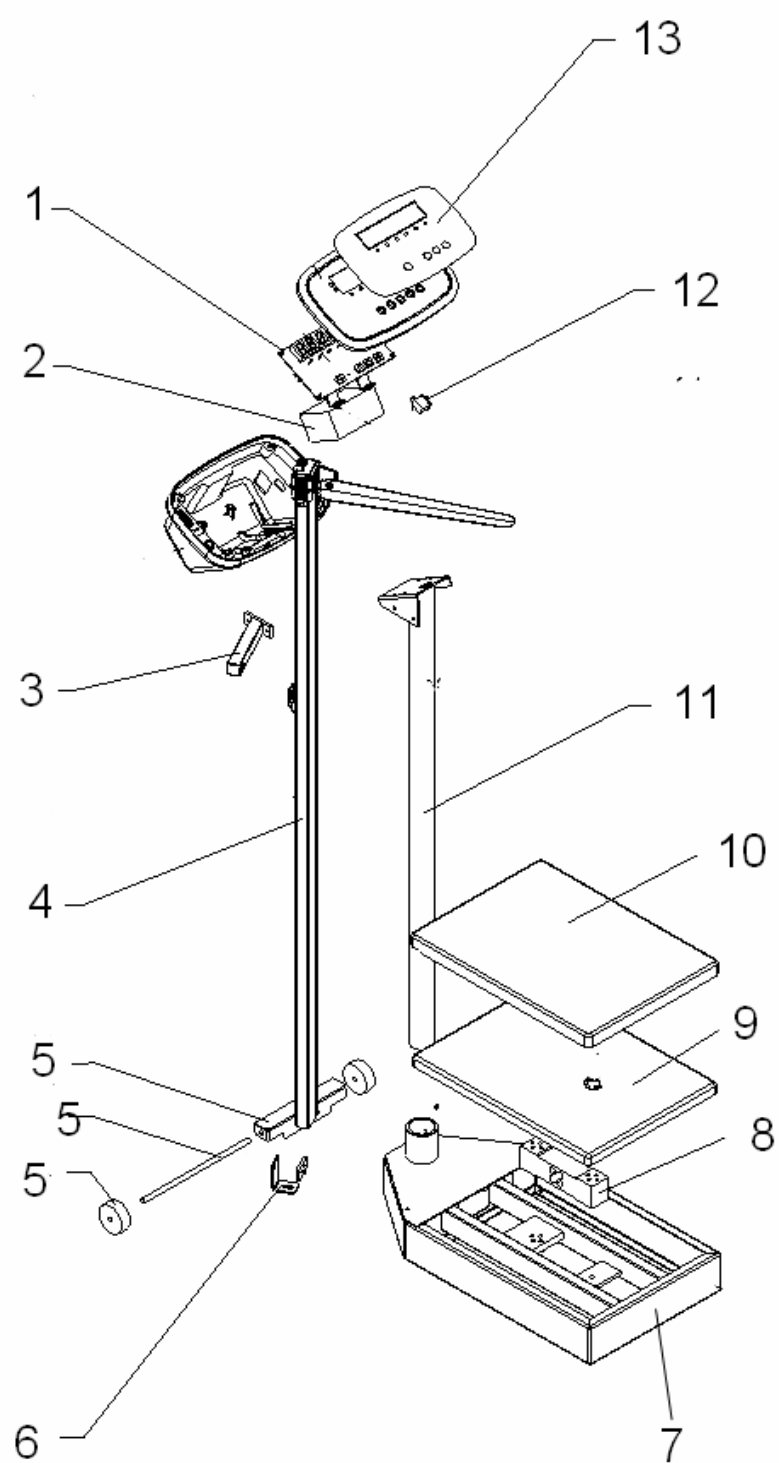
MDW 250L

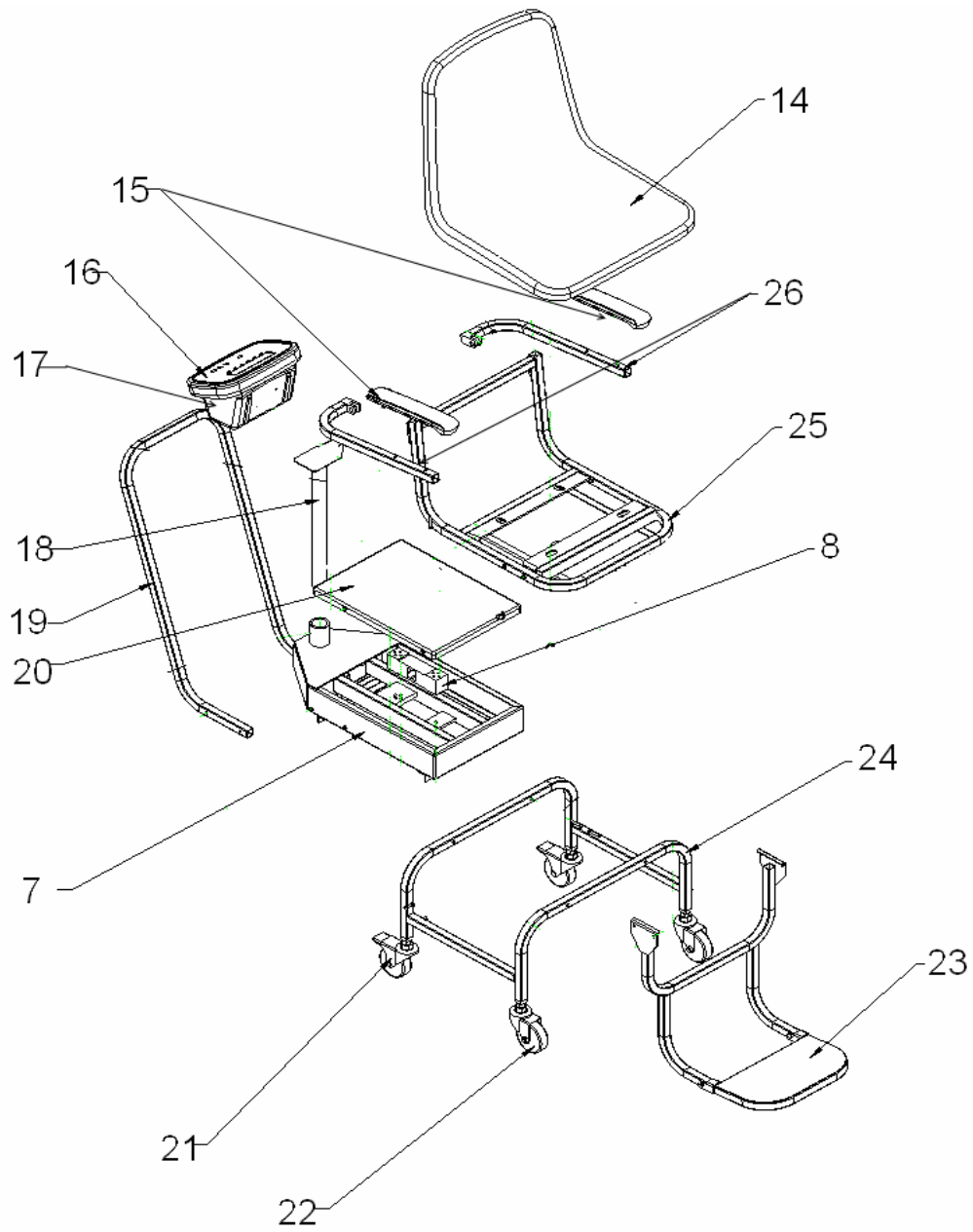
Part number	Description	Item No
7.00.1.0.0143	BASE FRAME	1
7.00.1.0.0144	HEIGHT ROD HOLDER	2
7.00.1.0.0145	METAL PLATFORM	3
7.00.2.0.0049	PLASTIC PLATFORM COVER	4
7.00.1.0.0146	210cm HEIGHT ROD	5
3.02.4.0.5088	6V dc 4.5ah BATTERY	6
7.00.5.6.0015	FASCIA	7
7.00.4.0.0037	MAIN / DISPLAY PCB- STATE WHICH REVISION	8
7.00.1.0.0147	LOAD CELL LCT LAE-A- 350kg cell	9
7.00.1.0.0148	PILLAR	10
7.00.1.2.0004	PILLAR HOLDER	11
7.00.4.0.0073	ON/OFF SWITCH	12
7.00.4.0.0074	POWER IN SOCKET	13
7.00.3.0.0012	COMPLETE PACKAGING SET	
3.02.4.0.9156	12v DC @800ma ADAPTOR-UK	
3.02.4.0.9160	12v DC @800ma ADAPTOR-USA	
3.02.4.0.9159	12v DC @800ma ADAPTOR-OZ	
3.02.4.0.9157	12v DC @800ma ADAPTOR-EURO	
3.02.4.0.9158	12v DC @800ma ADAPTOR-SA	
7.00.2.0.0048	INDICATOR ASSEMBLY	



MDW MCW 300L

Part number	Description	Item No
7.00.1.0.0247	MDW 300L HEIGHT ROD SUPPORT (UPPER)	3
7.00.1.0.0248	MDW 300L 210cm SQUARE HEIGHT ROD	4
7.00.2.0.0078	MDW 300L WHEEL ASSEMBLY	5
7.00.1.0.0258	MDW 300L HEIGHT ROD BRACKET (LOWER)	6
7.00.1.0.0145	MDW 300L METAL PLATFORM	9
7.00.2.0.0049	MDW 300L PLASTIC PLATFORM COVER	10
7.00.1.0.0249	MDW 300L PILLAR	11
7.00.2.0.0077	MDW 300L FASCIA	13
7.00.3.0.0020	MDW 300L COMPLETE PACKAGING SET	
7.00.0.0.0133	MDW 300L INDICATOR ASSEMBLY	
7.00.0.0.0126	MCW 300L CHAIR	14
7.00.2.0.0074	MCW 300L ARM REST (PLASTIC PART ONLY x 2)	15
7.00.2.0.0075	MCW 300L FASCIA	16
7.00.0.0.0127	MCW 300L INDICATOR ASSEMBLY	17
7.00.1.0.0245	MCW 300L PILLAR	18
7.00.1.0.0259	MCW 300L HANDLE	19
7.00.1.0.0243	MCW 300L METAL WEIGHING PLATE	20
7.00.2.0.0076	MCW 300L WHEEL WITH BRAKE (REAR)	21
7.00.1.0.0260	MCW 300L WHEEL SWIVEL (FRONT)	22
7.00.2.0.0073	MCW 300L FOOT REST FRAME ASSEMBLY	23
7.00.1.0.0261	MCW 300L WHEEL FRAME (EXC WHEELS)	24
7.00.1.0.0241	MCW 300L CHAIR FRAME ASSEMBLY	25
7.00.1.0.0262	MCW 300L ARM REST (METAL PART x 2)	26
7.00.3.0.0019	MCW 300L COMPLETE PACKAGING SET	
7.00.4.0.0066	MDW MCW 300L MAIN / DISPLAY PCB- WITH RS 232	1
3.02.4.0.5088	MDW MCW 300L BATTERY	2
7.00.1.0.0246	MDW MCW 300L BASE FRAME	7
7.00.1.0.0244	MDW MCW 300L LOAD CELL 300kg cell	8
7.00.4.0.0064	MDW MCW 300L ON/OFF SWITCH	12
7.00.4.0.0065	MDW MCW 300L LOAD CELL CONNECTOR (2 PARTS)	
3.02.4.0.9156	12v DC @800ma ADAPTOR-UK	
3.02.4.0.9160	12v DC @800ma ADAPTOR-USA	
3.02.4.0.9159	12v DC @800ma ADAPTOR-OZ	
3.02.4.0.9157	12v DC @800ma ADAPTOR-EURO	
3.02.4.0.9158	12v DC @800ma ADAPTOR-SA	





10.0 WARRANTY INFORMATION

Adam Equipment offers Limited Warranty (Parts and Labour) for the components failed due to defects in materials or workmanship. Warranty starts from the date of delivery.

During the warranty period, should any repairs be necessary, the purchaser must inform its supplier or Adam Equipment Company. The company or its authorised Technician reserves the right to repair or replace the components at any of its workshops depending on the severity of the problems. However, any freight involved in sending the faulty units or parts to the service centre should be borne by the purchaser.

The warranty will cease to operate if the equipment is not returned in the original packaging and with correct documentation for a claim to be processed. All claims are at the sole discretion of Adam Equipment.

This warranty does not cover equipment where defects or poor performance is due to misuse, accidental damage, exposure to radioactive or corrosive materials, negligence, faulty installation, unauthorised modifications or attempted repair or failure to observe the requirements and recommendations as given in this User Manual. Additionally rechargeable batteries (where supplied) are not covered under warranty.

Repairs carried out under the warranty does not extend the warranty period. Components removed during the warranty repairs become the company property.

The statutory right of the purchaser is not affected by this warranty. The terms of this warranty is governed by the UK law. For complete details on Warranty Information, see the terms and conditions of sale available on our web-site.



Manufacturer's Declaration of Conformity

This product has been manufactured in accordance with the harmonised European standards, following the provisions of the below stated directives:

Electro Magnetic Compatibility Directive 2004/108/EC

Low Voltage Directive 2006/95/EC

Adam Equipment Co. Ltd.
Bond Avenue, Denbigh East
Milton Keynes, MK1 1SW
United Kingdom

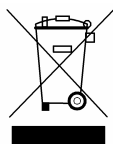
FCC COMPLIANCE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. The equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Shielded interconnect cables must be employed with this equipment to insure compliance with the pertinent RF emission limits governing this device.

Changes or modifications not expressly approved by Adam Equipment could void the user's authority to operate the equipment.

WEEE COMPLIANCE



Sealed Lead Acid
Battery
Must be recycled
Properly

Any Electrical or Electronic Equipment (EEE) component or assembly of parts intended to be incorporated into EEE devices as defined by European Directive 2002/95/EEC must be recycled or disposed using techniques that do not introduce hazardous substances harmful to our health or the environment as listed in Directive 2002/95/EC or amending legislation. Battery disposal in Landfill Sites is more regulated since July 2002 by regulation 9 of the Landfill (England and Wales) Regulations 2002 and Hazardous Waste Regulations 2005. Battery recycling has become topical and the Waste Electrical and Electronic Equipment (WEEE) Regulations are set to impose targets for recycling.

ADAM EQUIPMENT is an ISO 9001:2008 certified global company with more than 35 years experience in the production and sale of electronic weighing equipment.

Adam products are predominantly designed for the Laboratory, Educational, Health and Fitness, retail and Industrial Segments. The product range can be described as follows:

- Analytical and Precision Balances
- Compact and Portable Balances
- High Capacity Balances
- Moisture analysers / balances
- Mechanical Scales
- Counting Scales
- Digital Weighing/Check-weighing Scales
- High performance Platform Scales
- Crane scales
- Health and Fitness Scales
- Retail Scales for Price computing

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www.adamequipment.com

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